

SEQUENCE LISTING

<110> Glaxo Group Limited
The Governors of the University of Alberta

<120> New Process

<130> PB60213

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<170> FastSEQ for Windows Version 3.0

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<212> DNA

<213> Streptomyces clavuligerus

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<213> Streptomyces clavuligerus

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<211> 437

<212> PRT

<213> Streptomyces clavuligerus

<400> 3

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Glu Glu Ile Ala Gln Ala Ala Ala Glu Gln Met Arg Thr Leu Gly His
50      55      60
Phe His Thr Trp Gly Thr Ile Ser Asn Asp Lys Ala Ile Arg Leu Ala
65      70      75      80
Ala Arg Leu Thr Asp Leu Ala Pro Gln Gly Leu Gln Arg Val Tyr Phe
85      90      95
Thr Ser Gly Gly Gly Glu Gly Val Glu Ile Ala Leu Arg Met Ala Arg
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Tyr Phe His His Arg Thr Gly Ser Pro Glu Arg Thr Trp Ile Leu Ser
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Arg Arg Thr Ala Tyr His Gly Ile Gly Tyr Gly Ser Gly Thr Val Ser
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His His Leu Thr Pro Pro Asp Pro Tyr His Ala Glu Leu Tyr Asp Gly
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Glu Asp Val Thr Glu Tyr Cys Leu Arg Glu Leu Ala Arg Thr Ile Asp
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Glu Ile Gly Pro Gly Arg Ile Ala Ala Met Ile Gly Glu Pro Val Met
195     200     205
Gly Ala Gly Gly Ala Val Val Pro Pro Pro Asp Tyr Trp Pro Arg Val
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Tyr Val Pro His Gly Ala Val Leu Leu Thr Glu Glu Val Ala Asp Ala
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 Pro Thr Ala Cys Ala Val Ala Leu Ala Asn Leu Asp Ile Ile Glu Arg
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 Glu Gly Leu Leu Glu Asn Ala Val Lys Val Gly Asp His Leu Ala Gly
 325 330 335
 Arg Leu Ala Ala Leu Arg Gly Leu Pro Ala Val Gly Asp Val Arg Gln
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 Leu Gly Met Met Leu Ala Val Glu Leu Val Ser Asp Lys Thr Ala Arg
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 Thr Pro Leu Pro Gly Gly Thr Leu Gly Val Val Asp Ala Leu Arg Glu
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 Asp Ala Gly Val Ile Val Arg Ala Thr Pro Arg Ser Leu Val Leu Asn
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<212> PRT

<213> Streptomyces clavuligerus

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 85 90 95
 Leu Pro Asp Gly Ser Thr Pro Glu Leu Leu His Gln Pro Pro Gly Tyr
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 Tyr Glu Glu Leu Ser Ala Tyr Asp Phe Ala Val Gln Glu Ala Asn Arg
 165 170 175
 Leu Glu Gln Leu Arg Leu Gly Ala Val Glu Thr Trp Ala His Cys Cys
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 Leu Arg Leu Gly Arg Asp Glu Glu Val Met Asp Gln Leu Lys Pro Glu
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 Val Gln Arg Asn Pro Leu Arg Glu Arg Leu Ile Gly Gln Leu Met Gln
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 Ala Gln Tyr Arg Leu Gly Cys Gln Ala Asp Ala Leu Arg Thr Tyr Glu
 225 230 235 240
 Ala Thr Arg Arg Ala Leu Ala Glu Glu Leu Gly Thr Asp Pro Gly Lys
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 Glu Leu Ala Ala Leu His Ala Ala Ile Leu Arg Gln Asp Asn Gly Leu
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 Gly Ala Val Thr Val Ser Val Pro Ala Gln Arg Ser Arg Pro Leu Thr
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<213> Streptomyces clavuligerus
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<212> DNA

<213> Streptomyces clavuligerus

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<211> 1035

<212> DNA

<213> Streptomyces clavuligerus

<400> 7

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<211> 456

<212> DNA

<213> Streptomyces clavuligerus

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<213> Streptomyces clavuligerus

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 <213> Streptomyces clavuligerus

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 <213> Streptomyces clavuligerus

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 <213> Streptomyces clavuligerus

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<210> 13

<211> 1584

<212> DNA

<213> Streptomyces clavuligerus

<400> 13

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<212> DNA

<213> Streptomyces clavuligerus

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<213> Streptomyces clavuligerus

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<213> Streptomyces clavuligerus

<400> 16

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<213> *Streptomyces clavuligerus*

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ggggcgggcg	cggacgacgc	cgagaacgcc	gagaacgcg	tggaacgggt	ggacgcccag	1020

agcgccgtgg acttcgccgg gcagcggtgg gggtag

1056

<210> 21
 <211> 441
 <212> PRT
 <213> Streptomyces clavuligerus

<400> 21
 Val Pro Gly Ser Gly Leu Glu Ala Leu Asp Arg Ala Thr Leu Ile His
 1 5 10 15
 Pro Thr Leu Ser Gly Asn Thr Ala Glu Arg Ile Val Leu Thr Ser Gly
 20 25 30
 Ser Gly Ser Arg Val Arg Asp Thr Asp Gly Arg Glu Tyr Leu Asp Ala
 35 40 45
 Ser Ala Val Leu Gly Val Thr Gln Val Gly His Gly Arg Ala Glu Leu
 50 55 60
 Ala Arg Val Ala Ala Glu Gln Met Ala Arg Leu Glu Tyr Phe His Thr
 65 70 75 80
 Trp Gly Thr Ile Ser Asn Asp Arg Ala Val Glu Leu Ala Ala Arg Leu
 85 90 95
 Val Gly Leu Ser Pro Glu Pro Leu Thr Arg Val Tyr Phe Thr Ser Gly
 100 105 110
 Gly Ala Glu Gly Asn Glu Ile Ala Leu Arg Met Ala Arg Leu Tyr His
 115 120 125
 His Arg Arg Gly Glu Ser Ala Arg Thr Trp Ile Leu Ser Arg Arg Ser
 130 135 140
 Ala Tyr His Gly Val Gly Tyr Gly Ser Gly Gly Val Thr Gly Phe Pro
 145 150 155 160
 Ala Tyr His Gln Gly Phe Gly Pro Ser Leu Pro Asp Val Asp Phe Leu
 165 170 175
 Thr Pro Pro Gln Pro Tyr Arg Arg Glu Leu Phe Ala Gly Ser Asp Val
 180 185 190
 Thr Asp Phe Cys Leu Ala Glu Leu Arg Glu Thr Ile Asp Arg Ile Gly
 195 200 205
 Pro Glu Arg Ile Ala Ala Met Ile Gly Glu Pro Ile Met Gly Ala Val
 210 215 220
 Gly Ala Ala Ala Pro Pro Ala Asp Tyr Trp Pro Arg Val Ala Glu Leu
 225 230 235 240
 Leu His Ser Tyr Gly Ile Leu Leu Ile Ser Asp Glu Val Ile Thr Gly
 245 250 255
 Tyr Gly Arg Thr Gly His Trp Phe Ala Ala Asp His Phe Gly Val Val
 260 265 270
 Pro Asp Ile Met Val Thr Ala Lys Gly Ile Thr Ser Gly Tyr Val Pro
 275 280 285
 His Gly Ala Val Leu Thr Thr Glu Ala Val Ala Asp Glu Val Val Gly
 290 295 300
 Asp Gln Gly Phe Pro Ala Gly Phe Thr Tyr Ser Gly His Ala Thr Ala
 305 310 315 320
 Cys Ala Val Ala Leu Ala Asn Leu Asp Ile Ile Glu Arg Glu Asn Leu
 325 330 335
 Leu Asp Asn Ala Ser Thr Val Gly Ala Tyr Leu Gly Lys Arg Leu Ala
 340 345 350
 Glu Leu Ser Asp Leu Pro Ile Val Gly Asp Val Arg Gln Thr Gly Leu
 355 360 365
 Met Leu Gly Val Glu Leu Val Ala Arg Gly Thr Arg Glu Pro Leu Pro
 370 375 380
 Gly Ala Ala Val Ala Glu Ala Leu Arg Glu Arg Ala Gly Ile Leu Leu
 385 390 395 400
 Arg Ala Asn Gly Asn Ala Leu Ile Val Asn Pro Pro Leu Ile Phe Thr
 405 410 415
 Gln Glu Asp Ala Asp Glu Leu Val Ala Gly Leu Arg Ser Val Leu Ala
 420 425 430
 Arg Thr Arg Pro Asp Gly Arg Val Leu
 435 440

<210> 22
 <211> 188
 <212> PRT

<213> Streptomyces clavuligerus

<400> 22

Val Thr Arg Pro Pro Gly Leu Ser Ala His Thr His Gly Ser Val Ser
 1 5 10 15
 Gly Ser Leu Leu Arg Arg Val Ala Gly His Tyr Pro Thr Gly Val Val
 20 25 30
 Leu Val Thr Gly Pro Ala Glu Ala Pro Gly Gln Pro Pro Pro Ala Met
 35 40 45
 Val Val Gly Thr Phe Thr Ser Val Ser Leu Asp Pro Val Leu Val Gly
 50 55 60
 Phe Leu Pro Ala Arg Ser Ser Thr Thr Trp Pro Arg Leu Arg Ala Ala
 65 70 75 80
 Gly Arg Phe Cys Val Asn Val Leu Gly Ala Asp Gln Gly Pro Val Cys
 85 90 95
 Arg Ser Phe Ala Gly Gly Asp Pro Gly Arg Trp Glu Val Pro Tyr Arg
 100 105 110
 Thr Thr Ala Thr Gly Ser Pro Val Leu Leu Asp Ala Leu Ala Trp Phe
 115 120 125
 Asp Cys Glu Val Ala Gly Glu Thr Glu Ala Gly Asp His Trp Phe Val
 130 135 140
 Thr Gly Ala Val Arg Asp Leu Gly Val Ile Arg Glu Gly Ser Pro Leu
 145 150 155 160
 Val Phe Leu Arg Gly Asp Tyr Gly His Trp Ala Gly Gly Gly Gly Ser
 165 170 175
 Gly Arg Ala Gly Arg Arg Ser Ala Val Cys Pro Val
 180 185

<210> 23

<211> 391

<212> PRT

<213> Streptomyces clavuligerus

<400> 23

Met Arg Ala Ser Ser Pro Arg Gly Phe Arg Val His His Gly His Ala
 1 5 10 15
 Gly Ile Arg Gly Ser His Ala Asp Leu Ala Val Ile Ala Ser Asp Val
 20 25 30
 Pro Ala Ala Val Gly Ala Val Phe Thr Arg Ser Arg Phe Ala Ala Pro
 35 40 45
 Ser Val Leu Leu Ser Arg Asp Ala Val Ala Asp Gly Ile Ala Arg Gly
 50 55 60
 Val Val Val Leu Ser Gly Asn Ala Asn Ala Gly Thr Gly Pro Arg Gly
 65 70 75 80
 Tyr Glu Asp Ala Ala Glu Val Arg His Leu Val Ala Gly Ile Val Asp
 85 90 95
 Cys Asp Glu Arg Asp Val Leu Ile Ala Ser Thr Gly Pro Val Gly Glu
 100 105 110
 Arg Tyr Pro Met Ser Arg Val Arg Ala His Leu Arg Ala Val Arg Gly
 115 120 125
 Pro Leu Pro Gly Ala Asp Phe Asp Gly Ala Ala Ala Val Leu Gly
 130 135 140
 Thr Ala Gly Ala Arg Pro Thr Ile Arg Arg Ala Arg Cys Gly Asp Ala
 145 150 155 160
 Thr Leu Ile Gly Val Ala Lys Gly Pro Gly Thr Gly Pro Ala Glu Gln
 165 170 175
 Asp Asp Arg Ser Thr Leu Ala Phe Phe Cys Thr Asp Ala Gln Val Ser
 180 185 190
 Pro Val Val Leu Asp Asp Ile Phe Arg Arg Val Ala Asp Arg Ala Phe
 195 200 205
 His Gly Leu Gly Phe Gly Ala Asp Ala Ser Thr Gly Asp Thr Ala Ala
 210 215 220
 Val Leu Ala Asn Gly Leu Ala Gly Arg Val Asp Leu Val Ala Phe Glu
 225 230 235 240
 Gln Val Leu Gly Ala Leu Ala Leu Asp Leu Val Arg Asp Val Val Arg
 245 250 255
 Asp Ser Gly Cys Gly Gly Ala Leu Val Thr Val Arg Val Thr Gly Ala
 260 265 270

His Asp Thr Glu Gln Ala Gly Arg Val Gly Arg Ala Val Val Asp Ala
 275 280 285
 Pro Ser Leu Arg Ala Ala Val His Gly Pro Ala Pro Asp Trp Ala Pro
 290 295 300
 Val Ala Ala Val Ala Gly His Gly Asp Glu Gly Pro Gly Arg Ser
 305 310 315 320
 Pro Gly Arg Ile Thr Ile Arg Val Gly Gly Arg Glu Val Phe Pro Ala
 325 330 335
 Pro Arg Asp Arg Ala Arg Pro Asp Ala Val Thr Ala Tyr Pro His Gly
 340 345 350
 Gly Glu Val Thr Val His Ile Asp Leu Gly Val Pro Gly Arg Ala Pro
 355 360 365
 Gly Ala Phe Thr Val His Gly Cys Asp Leu Leu Ala Gly Tyr Pro Arg
 370 375 380
 Leu Gly Ala Gly Arg Ala Val
 385 390

<210> 24

<211> 351

<212> PRT

<213> Streptomyces clavuligerus

<400> 24

Val Ser Thr Ala Val Ser Pro Arg Tyr Ala Gln Pro Ala Thr Phe Met
 1 5 10 15
 Arg Leu Arg His Arg Pro Asp Pro Ile Gly His Asp Val Val Val Val
 20 25 30
 Gly Ala Pro Tyr Asp Gly Gly Thr Ser Tyr Arg Pro Gly Ala Arg Phe
 35 40 45
 Ala Pro Arg Ala Ile Arg His Glu Ser Ser Leu Ile His Gly Val Gly
 50 55 60
 Ile Asp Arg Gly Pro Gly Val Phe Asp Arg Ile Asp Val Val Asp Gly
 65 70 75 80
 Gly Asp Ile Asp Leu Ser Pro Phe Ser Met Asp Leu Ala Met Asp Thr
 85 90 95
 Ala Thr Val Ala Leu Thr Arg Leu Leu Glu Arg Asn Asp Ala Phe Leu
 100 105 110
 Met Leu Gly Gly Asp His Ser Leu Ser Leu Ala Ala Leu Arg Ala Val
 115 120 125
 His Ala Arg His Gly Arg Val Ala Val Leu His Leu Asp Ala His Ser
 130 135 140
 Asp Thr Asn Pro Pro Val Tyr Gly Gly Thr Tyr His His Gly Thr Pro
 145 150 155 160
 Phe Arg Trp Ala Ile Glu Glu Gly Leu Val Asp Pro Glu Arg Leu Val
 165 170 175
 Gln Val Gly Ile Arg Gly His Asn Pro Arg Pro Asp Ser Leu Asp Tyr
 180 185 190
 Ala Arg Gly His Gly Val Ser Ile Val Thr Ala Ala Asp Phe Thr Arg
 195 200 205
 Arg Ser Pro Arg Gly Ile Ala Glu Gln Ile Arg Arg Thr Val Gly Gly
 210 215 220
 Leu Pro Leu Tyr Val Ser Val Asp Ile Asp Val Val Asp Pro Ala Tyr
 225 230 235 240
 Ala Pro Gly Thr Gly Thr Pro Ala Pro Gly Gly Leu Ser Ser Arg Glu
 245 250 255
 Val Leu Thr Leu Leu Asp Val Val Gly Gln Leu Arg Pro Val Gly Phe
 260 265 270
 Asp Val Val Glu Val Ser Pro Ala Tyr Asp Pro Ser Gly Ile Thr Ser
 275 280 285
 Leu Leu Ala Ala Glu Ile Gly Ala Glu Leu Leu Tyr Gln Tyr Ala Arg
 290 295 300
 Ala Thr Thr Ser Pro Ala Ser Ala Pro Val Asp Ser Pro Leu Pro Pro
 305 310 315 320
 Gly Ala Ala Ala Asp Asp Ala Glu Asn Ala Glu Asn Ala Val Asp Ala
 325 330 335
 Val Asp Ala Glu Ser Ala Val Asp Phe Ala Gly Gln Arg Trp Gly
 340 345 350

<210> 25
 <211> 527
 <212> PRT
 <213> Streptomyces clavuligerus

<400> 25
 Met Pro Gly Pro Asp Leu Val Tyr Gly Phe Arg Val Arg Ile Gly Thr
 1 5 10 15
 Glu Gly Arg Pro Gly Gly Gly Pro Gly Gly His Ser Glu Pro Gly Ser
 20 25 30
 Ala Pro Arg Phe Ala Val Arg Gly Thr His Val Pro Val His Asp Gly
 35 40 45
 Thr Ala Tyr Pro Leu Trp Ser Gly Thr Ala Val Thr Leu Gly Arg Pro
 50 55 60
 Pro Val Leu Val Ala Asp Gly Gln Val Arg Leu Leu Ala Gly Glu
 65 70 75 80
 Leu Tyr Asn Arg Ala Glu Leu Thr Gly Ala Leu Gly Gly Ser Ser Ala
 85 90 95
 Ala Leu Gly Asp Ala Glu Leu Leu Leu Ala Ala Trp Arg Arg Trp Gly
 100 105 110
 Pro Gly Ala Phe Arg Leu Leu Asn Gly Arg Phe Ala Ala Leu Leu Thr
 115 120 125
 Asp Ala Ser Thr Gly Ala Thr Val Ala Ala Thr Asp His Ala Gly Ser
 130 135 140
 Val Pro Leu Trp Leu Arg Ala Asp Val Thr Gly Leu Ser Ala Ala Thr
 145 150 155 160
 Glu Ala Lys Thr Leu Ala His Glu Pro Gly Arg Pro Leu Gly Leu Ser
 165 170 175
 Gly Thr His Thr Ala Pro Gly Ala Ala Gly Val Cys Arg Val Pro Ala
 180 185 190
 Gly Thr Ala Leu Leu Leu His Gly Val Gly Gly Ser Asp Ile Thr Ala
 195 200 205
 Arg Ala Val Arg Thr Trp Thr Pro Pro Leu Ser Arg Ala Leu Pro Gly
 210 215 220
 Glu Arg Glu Ala Val Asp Leu Val Gly Glu Arg Leu Ala Thr Ala Val
 225 230 235 240
 Arg Thr Arg Leu Arg Gly Gly Glu Ala Ala Pro Thr Val Val Leu Ser
 245 250 255
 Gly Gly Ile Asp Ser Gly Gly Val Ala Ala His Thr Ala Ala Leu Ala
 260 265 270
 Pro Gly Thr Arg Ser Val Ser Met Gly Thr Glu Val Ser Asp Glu Phe
 275 280 285
 Asp Ala Ala Arg Ser Val Ala Val His Leu Gly Thr Ala His Ser Glu
 290 295 300
 Ile Arg Leu His Ser Ala Glu Leu Val Arg Glu Leu Pro Trp Ala Val
 305 310 315 320
 Ala Ala Ala Glu Ile Thr Asp Pro Thr Val Leu Glu Tyr Leu Leu Pro
 325 330 335
 Leu Val Ala Leu Tyr Arg Arg Leu Asp Thr Gly Pro Leu Arg Ile Leu
 340 345 350
 Thr Gly Tyr Gly Ala Asp Ile Pro Leu Gly Gly Met His Arg Arg Thr
 355 360 365
 Ala Ser Leu Trp Ser Leu Asp Asp Glu Ile Ala Gly Asp Met Ala Gly
 370 375 380
 Phe Asp Gly Leu Asn Glu Met Ser Pro Val Leu Ala Gly Ile Ala Gly
 385 390 395 400
 Lys Trp Thr Thr His Pro Tyr Trp Asp Arg Ala Val Leu Asp Ala Leu
 405 410 415
 Val Ser Leu Glu Pro Gly Leu Lys Arg Arg Arg Gly Thr Asp Lys Trp
 420 425 430
 Val Leu Arg Gln Ala Leu Ser Gly Leu Leu Pro Ala Glu Thr Val Ala
 435 440 445
 Arg Pro Lys Leu Gly Ile His Glu Gly Ser Gly Thr Thr Ser Ala Trp
 450 455 460
 Thr Gly Leu Leu Leu Ala Glu Gly Ile Arg Arg Asp Glu Val Thr Ala
 465 470 475 480
 Val Lys Gly Ala Met Ala Arg Arg Leu Tyr Asp Ala Val Val Ile Asp
 485 490 495

Thr Val Pro Pro Glu Asp Val Asp Phe Gly Glu Thr Val Arg Arg Ser
 500 505 510
 Val Asp Ala Val Arg Arg Leu Arg Leu Gln Gly Arg Val Val Val
 515 520 525

<210> 26
 <211> 555
 <212> PRT
 <213> Streptomyces clavuligerus

<400> 26
 Met Ala Thr Thr Thr Ala Lys Ala Met Leu Glu Arg Leu His Gln Tyr
 1 5 10 15
 Gly Val Asp His Val Phe Gly Val Val Gly Arg Glu Ala Ser Ala Ile
 20 25 30
 Leu Phe Asp Glu Val Glu Gly Leu Asp Phe Val Leu Thr Arg His Glu
 35 40 45
 Phe Thr Ala Gly Val Met Ala Asp Val Leu Ala Arg Ile Thr Asn Arg
 50 55 60
 Pro Gln Ala Cys Phe Ala Thr Leu Gly Pro Gly Met Thr Asn Leu Ala
 65 70 75 80
 Thr Gly Val Ala Thr Ser Ala Leu Asp Arg Ser Ser Val Ile Ala Leu
 85 90 95
 Ala Ala Gln Ser Glu Ser Tyr Asp Cys Tyr Pro Asn Val Thr His Gln
 100 105 110
 Cys Leu Asp Ser Thr Ala Val Met Gly Pro Leu Thr Lys Phe Ser Val
 115 120 125
 Gln Leu Glu Arg Gly Glu Asp Ile Val Asn Leu Val Asp Ser Ala Val
 130 135 140
 Leu Asn Ser Arg Ile Glu Pro Val Gly Pro Ser Phe Ile Ser Leu Pro
 145 150 155 160
 Val Asp Leu Leu Gly Ala Glu Leu Asn Gly Thr Pro Thr Asp Ala Pro
 165 170 175
 Leu Val Arg Ala Thr Ala Thr His Ala Leu Asp Ala Asp Trp Arg Ala
 180 185 190
 Arg Leu Asp Glu Ala Ala Glu Leu Val Arg Glu Ala Glu Asn Pro Leu
 195 200 205
 Leu Val Val Gly Ser Ala Val Ile Arg Ala Gly Ala Val Asp Ala Leu
 210 215 220
 Arg Ala Leu Ala Glu Arg Leu Asn Ile Pro Val Val Thr Thr Tyr Thr
 225 230 235 240
 Ala Lys Gly Val Leu Pro His Asp His Pro Leu Asn Tyr Gly Ala Ile
 245 250 255
 Ser Gly Tyr Met Asp Gly Ile Leu Gly His Pro Ala Leu Asp Glu Ile
 260 265 270
 Phe Gly Pro Ala Asp Leu Leu Leu Ala Ile Gly Tyr Asp Tyr Ala Glu
 275 280 285
 Asp Leu Arg Pro Ser Met Trp Thr Arg Gly Arg Ala Lys Thr Thr Val
 290 295 300
 Arg Val Ala Pro Glu Val Asn Pro Ile Pro Glu Leu Phe Arg Ala Asp
 305 310 315 320
 Ile Asp Ile Val Thr Asn Val Ala Glu Phe Val Thr Ala Leu Asp Asp
 325 330 335
 Ala Thr Ser Gly Leu Ala Pro Lys Thr Arg His Asp Leu Ser Ala Leu
 340 345 350
 Arg Ala Arg Val Ala Glu Phe Leu Ala Asp Pro Thr Glu Tyr Glu Asp
 355 360 365
 Gly Met Arg Val His Gln Val Ile Asp Cys Met Asn Ser Val Leu Asp
 370 375 380
 Asn Gly Thr Phe Val Ser Asp Ile Gly Phe Phe Arg His Tyr Gly Val
 385 390 395 400
 Leu Phe Ala Lys Ser Asp Gln Pro Tyr Gly Phe Leu Thr Ser Ala Gly
 405 410 415
 Cys Ser Ser Phe Gly Tyr Gly Leu Pro Ala Ala Met Ala Ala Gln Ile
 420 425 430
 Ala Arg Pro Gly Glu Pro Val Phe Leu Ile Ala Gly Asp Gly Gly Phe
 435 440 445
 His Ser Asn Ser Ala Asp Ile Glu Thr Ala Val Arg Leu Gly Leu Pro

450						455						460					
Ile	Val	Met	Val	Val	Val	Asn	Asn	Asp	Arg	Asn	Gly	Leu	Ile	Glu	Leu		
465						470					475				480		
Tyr	Gln	Asn	Leu	Gly	His	Gln	Arg	Ser	His	Ala	Pro	Ala	Val	Gly	Phe		
				485						490				495			
Gly	Ser	Val	Asp	Phe	Val	Gln	Leu	Ala	Glu	Ala	Asn	Gly	Cys	Glu	Ala		
			500					505					510				
Val	Arg	Ala	Thr	Asp	Arg	Thr	Ser	Leu	Leu	Ala	Ala	Leu	Thr	Lys	Gly		
		515					520					525					
Ala	Gly	Leu	Gly	Arg	Pro	Phe	Leu	Ile	Glu	Val	Pro	Val	Ala	Tyr	Asp		
		530				535					540						
Phe	Gln	Ser	Gly	Gly	Phe	Ala	Ala	Leu	Ala	Ile							
545					550					555							